



IMPROVING ACCURACY THROUGH EMERGING TECHNOLOGY IN EVENT DATA RECORDERS

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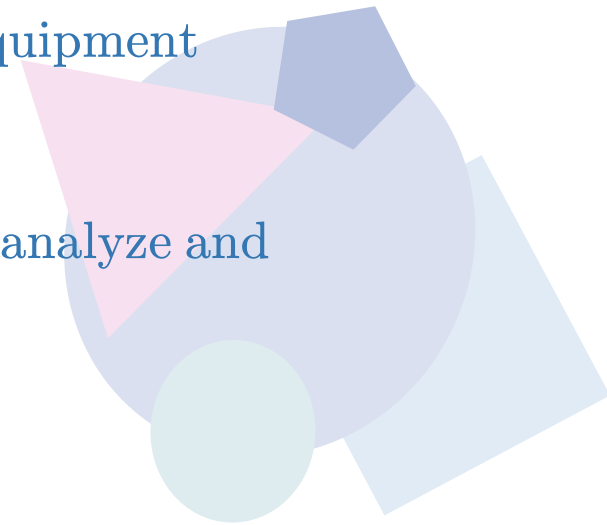
Event Data Recorders

- EDR is a component of all Airbag Control Modules
- In 2006, NHTSA released 49CFR563, regulating EDR
 - Minimum reporting requirements, e.g. speed, braking, seatbelts
 - Data must be commercially available
- The EDR records continuously
- A triggering event will “lock” the recording
- “Deployment” or “Non-Deployment” Events

Some
Background.....

PROJECT GOALS

- Provide the most up-to-date equipment to all members of CARS to capture volatile crash data
- Obtain appropriate software license to operate specific equipment
- Train and certify current members of CARS to correctly analyze and interpret crash data



PROPOSAL

Acquire twenty-two (22) Bosch CDR900 Kits with cases
Total Cost \$100,300

Acquire three (3) Tesla Kits
Total Cost \$4,620

Acquire one (1) Hyundai EDR Kit
Total Cost \$4,758

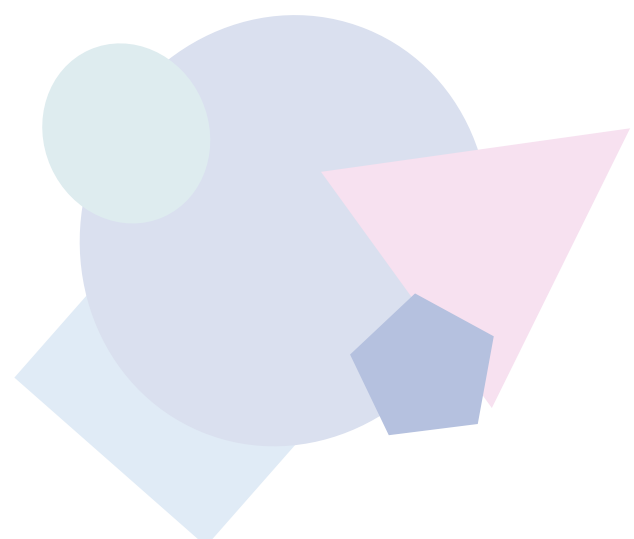
Acquire one (1) software license for Hyundai EDR Kit
Total Cost \$908

Acquire one (1) Kia EDR Kit
Total Cost \$4,758

Acquire one (1) software license for Kia EDR Kit
Total Cost \$908

Host a forty (40) hour course in EDR Analysis, Level 2
Total Cost \$16,500

TOTAL COST:
\$132,750



Bosch CDR 900

Supported vehicles go back as far as
1994

88% of model year 2016 and
newer are supported

Can be only available
evidence in a crash

Some of the vehicles
supported by Bosch...

2012-2019 Acura MDX

2013-2019 Acura RDX

2012-2013 Acura TL

2013-2014 Acura TL

2014-2019 Acura TLX

2017-2019 Acura ILX

2013-2019 Acura ILX

2012-2014 Acura ZDX

2012-2013 Acura ZDX

2015-2019 Acura TLX

2015-2019 Audi A3

2015-2019 Audi A4

2017-2019 Audi RS6
2017-2019 Audi RS7
2015-2019 Audi S3

2015-2019 Audi S6

2015-2019 Audi S7

2015-2019 Audi S8

2017-2019 Audi SQ5

2017-2019 Audi SQ7

2017-2019 Audi R8
2017-2019 Audi RS3

2015-2019 Audi RS5

2015-2019 Audi S5

2017-2019 Audi S4

2017-2019 Audi Q7

1994-2007 Cadillac Commercial

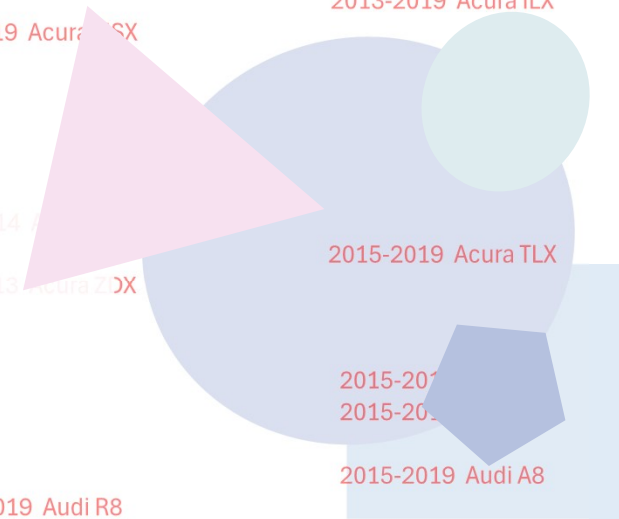
1995-1997 Cadillac Concourse
2016-2019 Cadillac CT6

2006-2011 Cadillac DTS

1995-2005 Cadillac Deville

2003-2019 Cadillac CTS

2013-2019 Cadillac ATS





Bosch CDR 900

Data can include:

Seatbelt Usage

Speed

Brakes

Engine RPM

Throttle

ABS

Cruise Control Status

Gear Position

Roll Angle/Roll Rate

Vehicle Fault Codes

Traction Control

Turn Signal Operation

Yaw Rate

Tire Pressure

Change in Velocity

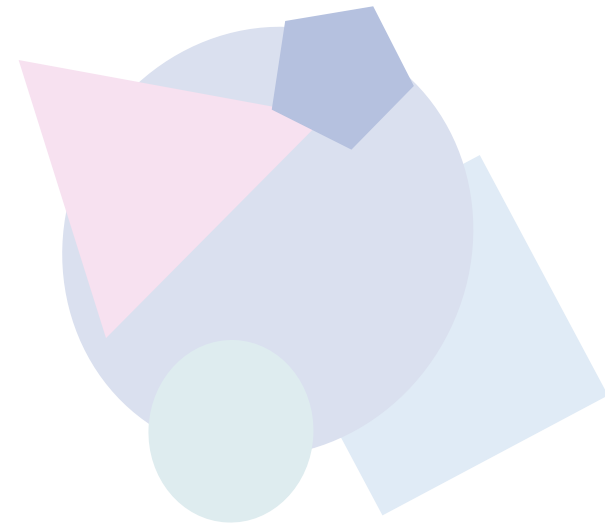
Manifold Pressure

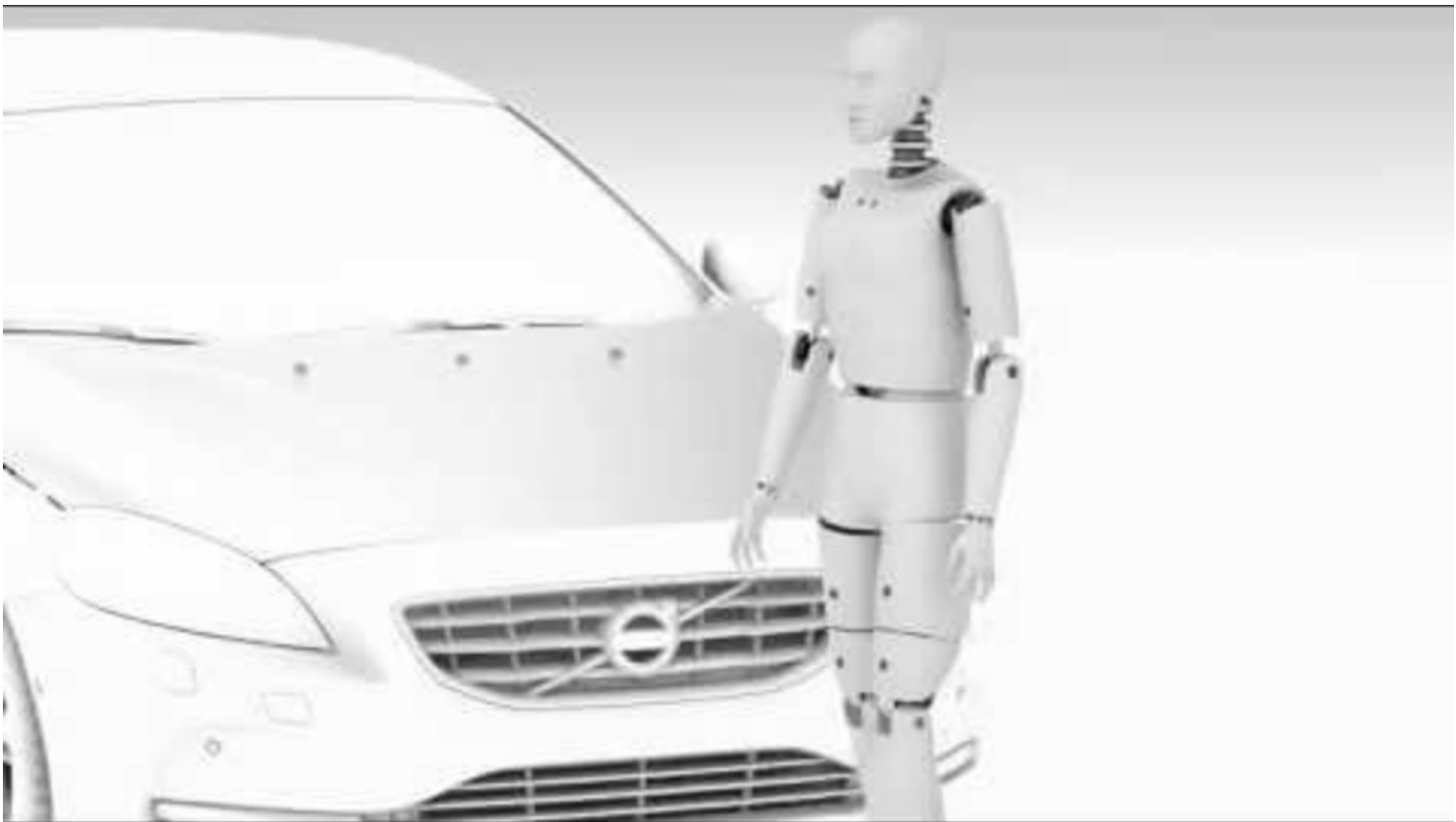
Steering Input

Bosch CDR 900

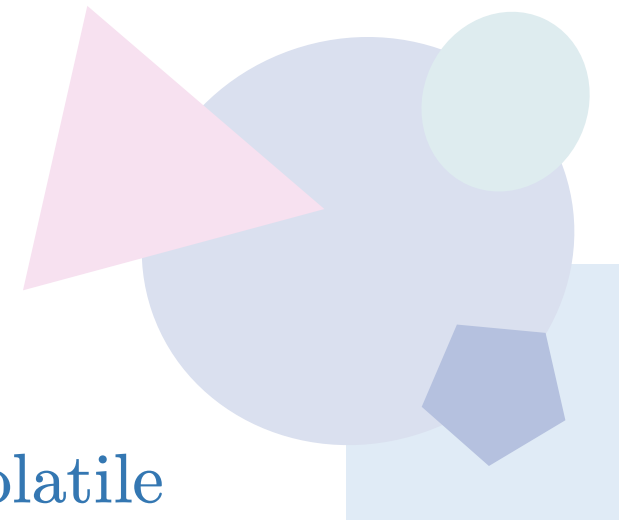
EMERGING TECHNOLOGY

- Pre-Collision Detection Systems
- Lane Departure Alerts
- Dynamic Radar Cruiser Control
- Automatic Emergency Braking





ON SCENE INVESTIGATIONS



- Data from Non-Deployment Events is volatile and can be overwritten
- Crashes involving vulnerable users can often trigger Non-Deployment Events
- Securing data while on scene is sometimes necessary to preserve evidence



ON SCENE INVESTIGATIONS

- Currently six (6) Bosch CDR900 kits in the field
- CARS has 23 Troopers, 4 Sergeants, and 1 Lieutenant
- CARS investigates 65-70% of all fatal crashes in the Commonwealth
- CARS responds to 350-400 crash investigations each year

ON SCENE INVESTIGATIONS

- A total of 28 kits will allow CARS to quickly preserve electronic evidence in most vehicles we encounter at or near the time of the crash
- Improved accuracy and timeliness of data will provide a clearer picture of the crash, including:
 - Driving Behavior
 - Vehicle Features/Defects



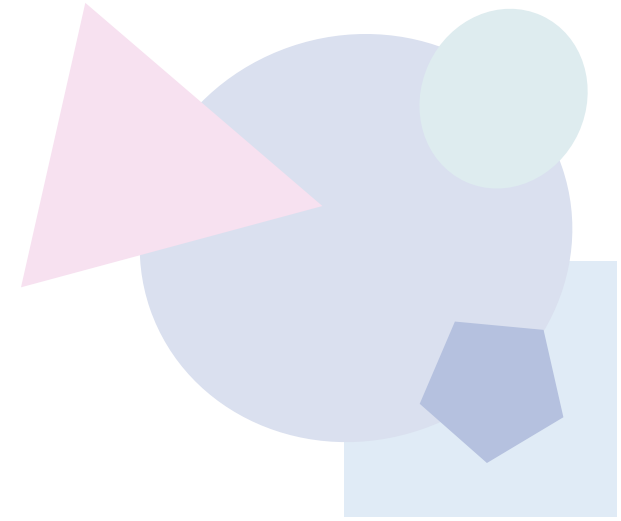
ADDITIONAL EQUIPMENT

Tesla Kits



ADDITIONAL EQUIPMENT

- CARS has one kit in use
- Rapidly expanding field of electric vehicles
- Tesla vehicles are leaders in this fast-growing market
- Expect to see a significant increase in Tesla vehicles in the coming years





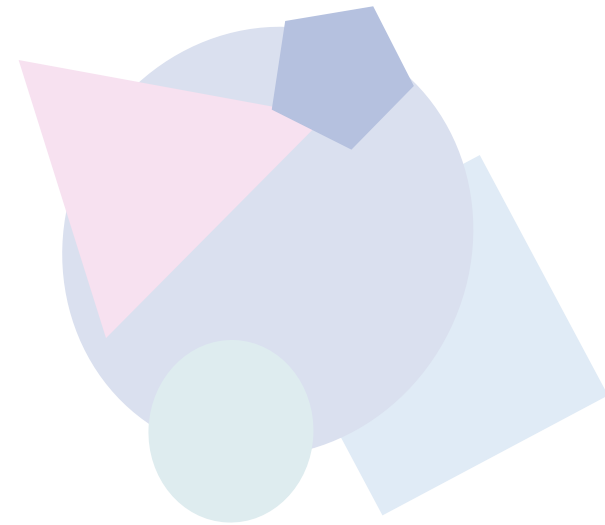
ADDITIONAL EQUIPMENT

Kia/Hyundai Kits

- CARS currently has one Kia & one Hyundai kit in use
- Approximately 1 in 20 vehicles in the US are either Hyundai or Kia
- Each kit requires a unique license, renewed annually, to register data from these vehicles

METRICS

- High-speed crash damage vs. vulnerable users
- Accessing data through the OBD-II port
- Vehicle testing on scene
- Preserving volatile data
- Expected improvement ~80%

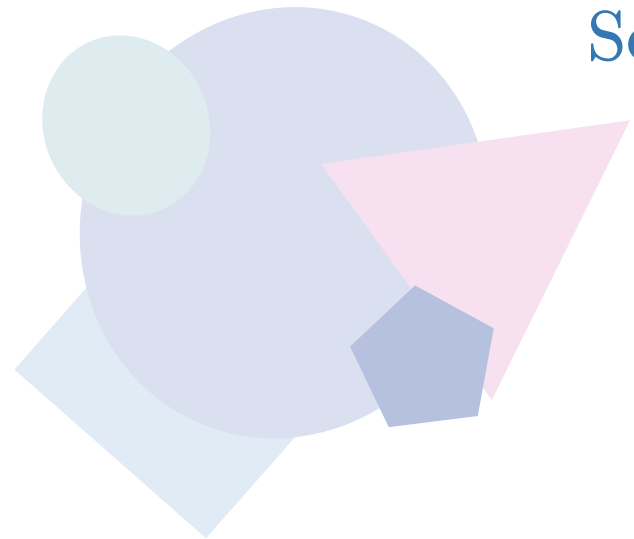


INSTRUCTION

Event Data Recorder Use in Traffic Crash
Reconstruction – Level 2

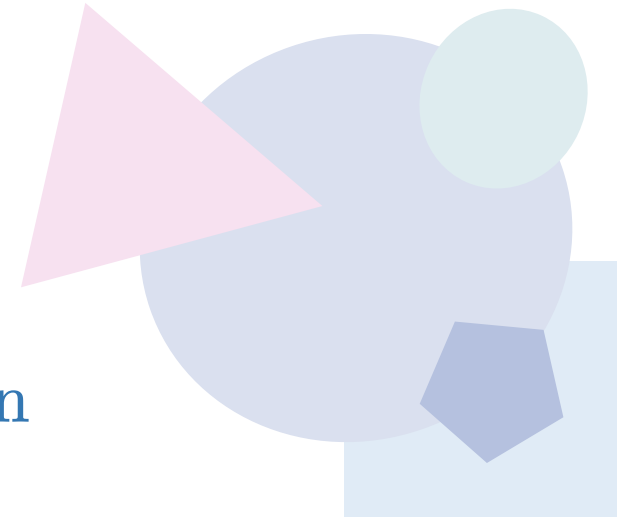
Scheduled for September 23rd in
Southbridge

40 hour class



INSTRUCTION

- Applying recovered data to reconstruction
- Includes:
 - Conservation of linear momentum
 - Restitution
 - Rotation
 - Delta-V
- EDR Use in TCR – Level 1 completed in April



QUESTIONS

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